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A Conceptual Framework to Create Shared Value in Base of the Pyramid Communities with Micro-Containerised Factories

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Abstract

Shared value creation at the Base of the Pyramid (BoP) receives growing interest. The BoP is a socio-economic group characterised by people who have poor nutrition, limited income, inadequate technologies, lack of access to markets and poor infrastructure to produce valuable products and services. Possible methodologies and systems to successfully implement sustainable micro-containerised factories at the BoP are still very limited and remain unanswered. In this study a conceptual framework to create shared value in BoP communities with micro-containerised factories is developed. These factories provide portable, scalable technologies to produce valuable products from sustainable locally sourced resources or waste streams. Concepts from literature and case studies were evaluated to identify key elements for the conceptual framework. A proposed business model and conceptual framework were developed to guide business model prototyping in a case study in South Africa.

Keywords: Creating Shared Value; Base of the Pyramid communities; Micro-containerised factoreis

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1. Introduction

The Base of the Pyramid (BoP) is characterised by the informal economy, which provides opportunities for entrepreneurship and employment creation. Youth unemployment in South Africa has continued to rise and stands at 54.5% [1]. This calls for innovative solutions to reduce unemployment and improve livelihoods in BoP communities.

Creating shared value in BoP communities has become a global reality. It is approximated that about two-fifths of the world's population consists of people who live on an irregular and unpredictable income of less than two dollars per day [2]. This is commonly known as the BoP market segment, which cannot be ignored anymore because of its attractive high population that presents opportunities for economic growth for developing countries. Pursuing this market is accompanied by a lot of constraints, but being able to improve livelihoods in BoP communities far outweighs these challenges. The BoP is characterised by institutional voids which limit capabilities for manufacturing of products, their distribution and marketing [3]. This predicament requires focused entrepreneurial innovators, who are proactive to create rich social networks and have intuitive customer insight to understand their retailing habits [3]. Serving the BoP consumers will require innovations in technology, access to information, training and business models that are implemented with support from local government [4].

Literature has shown that many have come up with different strategies and business models for the BoP, but it is not yet clear how Micro-containerised factories (MCF) can be successfully implemented in BoP communities. The aim of this study is to develop a business model and conceptual framework for creating shared value in BoP communities with MCF. In the paper, a review of previous literature was used to explain how to create shared value in BoP communities with MCF and analyse previous BoP conceptual frameworks to come up with various concepts that ensure successful and sustainable business models. In the methodology section, a detailed description of the steps taken to ensure the development of a successful business model and conceptual framework was given. The following section discusses the results from the systematic literature review. A business model and conceptual framework to create shared value in BoP communities with MCF are also proposed in the section. Lastly, the proposed framework is linked to a case study in Delft community in Western Cape, South Africa. This case study will provide a platform for business model prototyping.

1.1. Creating Shared value in BoP Communities with MCF

The idea is to have Social Enterprises (SEs) that have capabilities to run profitably, whilst creating social and environmental impact in BoP communities. This applies the principle defined as creating shared value, which was coined by Porter and Kramer in 2006. Creating shared value is characterised by policies and operating practices of businesses, competitiveness, stakeholder engagement and generating profits, whilst creating social value in communities and redefining productivity on the value chain [5]. To create shared value in BoP communities requires building trust and relationships between business and society [5]. A SE is a social purpose business venture that creates economic opportunities for the BoP, whilst being economically viable in a sustainable way [6]. SEs have evolved from the 19th century and are being seen to fulfil the sustainable development goals in the 21st century [6]. The common phases for SEs begin with opportunity recognition to identify social needs, followed by concept development to choose an appropriate solution, and then mobilizing resources towards actualization of the innovation, which results in a social impact [7].

The proposed SEs in this study will start up using external funding to run profitably, such that the initial capital injection becomes a revolving fund for scaling up. Currently, funding opportunities to start up a SE with capability to scale are being encouraged for the donor communities [8]. SEs that empower women play a key role in maintaining stability and improving societies by enabling women to play a more central role in economic growth and well-being of families [9]. Ultimately, these SEs aim to engage the BoP as producers so as to create jobs, which is a priority for economic development [10].

These SEs will be in the form of MCF. The MCF allow for modularity and reconfigurability in manufacturing, where any unit process can be exchanged or replaced by other units with little effort [11]. Reconfiguration and reuse of factory systems represents a chance to comply to both the economic objective of increasing cost efficiency and the ecological objective of increasing the efficient use of resources and decreasing waste [12]. MCF can provide the infrastructure that uses established technologies for profitable manufacturing with low capital costs and less need for

manufacturing skills in BoP communities as a means for capability building [13]. The implementation of micro-factory technologies into real factory environments is still rare and yet to be considered in BoP communities [12]. These MCF can be connected to form a global manufacturing network, which shares knowledge through open community manufacturing systems, presenting an opportunity to foster social sustainability [14][15]. It was established that the BoP communities have an appetite for MCF which have the capability to create shared value and improve livelihoods in their communities [16].

1.2. Previous Frameworks for creating shared value in BoP communities

BoP ventures can be developed through phases beginning with market co-creation, followed by venture design after which a pilot can be implemented and then scaled up [17][18]. The Base of the Pyramid Impact Assessment Framework can be used to analyse the potential changes in economics, capabilities and relationships for sellers and buyers and the community. This is done by providing a systematic process for measuring and enhancing the effects of venture activities on the well-being of sellers (local distributors or producers), buyers (local consumers or agents), and communities [19]. The suppliers and customer logic value creation framework was developed to share the value creation links that can be created between suppliers, customers, business models and operations [20]. A holistic framework for developing local manufacturing suppliers was established for companies and communities to identify shared value opportunities [21]. This framework was selected as a baseline for developing the proposed conceptual framework for creating shared value with MCF. The framework was more specific to this study and addressed most of the fundamental concepts required to create manufacturing shared value in BoP communities.

Case studies from BoP literature review show success stories from business models to do with mainly microfinance and telecommunications. However, Sustainable business models (SBM) for implementing MCF in BoP communities are yet to be developed. Creating a fortune at the BoP with MCF is important since businesses should focus more on empowering the BoP market. It is very crucial that SE are operated using SBM. A business model is a conceptual tool that defines how a SE can create, deliver and capture value for sustainability [22]. Business models are especially a fundamental requirement for BoP communities, where resources are scarce and poverty affects the wellbeing of these populations [23]. Business model development in BoP communities requires continuously building awareness about products, ensuring affordability, availability and acceptability in market development and social embeddedness [24].

Business model development at the BoP is guided by community interaction, partnerships, capacity building, technology innovation, developing strong distribution networks, ability to recycle materials and to address barriers such as lack of affordability and knowledge of products [3]. Business model design for the BoP should include sustainable supply chains by integrating all local actors at various stages to ensure success and sustainability of the ventures [25]. Stakeholder relations should be managed well to attain SBM [26]. Creating an ecosystem of a particular business model presents opportunities for social entrepreneurs. This allows upcoming social entrepreneurs to follow the business model allowing for growth [27]. Sustainable business models for social enterprises must scale up at some point. Scaling up results in more beneficiaries, whilst maintaining financial stability and long term social mission [28]. One way to scale up BoP ventures is through micro-franchising, which is a market based solution within BoP markets [29].

2. Research Methodology

The approach of this study is to discuss the most relevant and appropriate theories and models for shared value creation in BoP communities. A systematic literature review was conducted to establish all the variables that are key to successful implementation of BoP ventures. The systematic literature review will be used to gather and analyse a wide range of research studies and publications previously conducted to come up with empirical evidence on the research area [30]. Hence, the literature reviewed was used to analyse the different frameworks and business models that have been used previously to formulate the proposed framework. A case study was selected to illustrate how the conceptual framework will work. This case study is for Delft community in South Africa. The case study is to show the progression from business incubation in BoP communities to implementation of SEs which can then be scaled up. The idea is to train local community members entrepreneurship skills and expose them to running a SE and then they proceed to run their own social enterprises in the community.

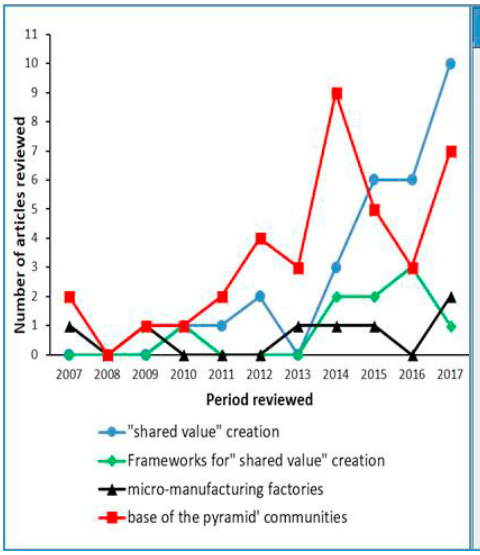
As described in [30], the systematic literature review was conducted in three stages. The initial stage involved planning the review, where research questions were defined and then search terms that are specific to the study area were used to find different publications using the selected databases. The next stage was to conduct the review by selecting relevant articles and publications initially by topic, followed by the abstract and keywords, then by introduction and conclusion and finally reviewing the whole document to select studies that are specific to the study area. The final stage involved evaluating the selected articles and publication through data extraction and analysis

The systematic review was used to identify frameworks, business models and case studies that have been used previously to create shared value in BoP communities. Key search terms were selected, namely: shared value creation, frameworks for creating shared value in BoP communities, BoP communities and MCF. These search terms were used to conduct searches in three databases, namely, Scopus, Science Direct and Web of Science, restricting the years between 2007 and 2017. In some cases, the search terms were used with inverted commas to narrow down the search results. From the searches conducted a total of 127 articles were nominated based on the introduction and conclusions for literature analysis. Not all the 127 articles were relevant, which left 86 articles to be fully analysed. In this analysis concepts for shared value creation in BoP communities were extracted. The key concepts were used to develop a proposed business model and a conceptual framework, which were then linked with a case study in Delft community.

3. Results from the systematic literature review

The results from the conducted study show that most of the articles reviewed were from the search terms base of the pyramid communities and shared value creation. The lower occurrence of articles on frameworks for shared value creation and MCF show the need for further research to develop frameworks for shared value in BoP communities with MCF. The articles that were selected for the analysis ranged between 2007 and 2017. Figure 1 (a) shows the number of articles that were selected for literature analysis based on the identified search terms. The trend reveals a general increase of the articles of interest that have been published in the past ten years. It is interesting to note in Figure 1 (a), that most of the articles have been written in the last four years, which shows the growing interest in academia and research on the study area. A significant number of the journals articles that were reviewed are from the Journal for Cleaner Production and the Journal of Business research. The systematic literature study was used to extract various concepts that are fundamental for building successful business models and frameworks for BoP ventures summarized in Figure 1(b). These concepts can be adopted in two phases; Phase one has concepts that are to do with capability building, and phase 2 has concepts that are used to create supply and demand in a given BoP market. It is necessary to ensure that phase 1 which requires that there is sufficient capability building in BoP communities is accomplished before the actual implementation of the MCF.

a



b

Phase 1 - Capability Building	Phase 2 - Supply and Demand
Establish a shared value creation centre • Build a team • Draft a proposal • Create social network platforms **Craft an SBM** • Ensure viability • Self-sustainability • Value capture • Clear social purpose • Value proposition **Build Partnerships** • Create social purpose • Institutional legitimacy • Build trust **Source Funding** • Crowdfunding • Donor community • Grants • CSR from MNCs	**Engage the BoP** • Ensure deep inclusion • Identify needs and available resources • Identify female entrepreneur • Create awareness • Build trust • Skills building **Site selection** • Ensure community support • Appropriate location • Security • Water and electricity source **Create supply chain networks and markets** • Ensure accessibility • Product sales • Create market opportunities • Local adaptability **Implement micro-factories** • Provide infrastructure and technology • Sustainable manufacturing practices • Efficiency • Performance measurement **Scale up** • Competitiveness • Social innovation ecosystem • Affordability of products • Formal market penetration • Growth in revenues • Improve livelihoods

Figure 1: Results from the literature review (a) Number of published articles analysed; (b) Summary of concepts for developing BoP frameworks

4. Proposed business model

The proposed business model for the MCF is illustrated in Table 1 and Figure 2. The process will begin with establishing partnerships between a university, an NGO, a technology partner, and the local government. The university will be responsible for the technical know-how and research and training. The NGO will be responsible for the community engagement; hence it is a prerequisite that they should be already operating in the community. The NGO will also assist in identifying a female local entrepreneur, who is able to run the MCF as a proper business. The technology partners will come through with the relevant technology or innovation for the MCF. Different technology partners can be engaged depending on the social innovation required by a BoP community. The local government will assist in site allocation and provide access to electricity and water.

Table 1. The proposed business model for the micro-containerised factories

BoP Venture	Target Customers	Key Partners	Value Proposition	Value Capture	Value chain/ Value Creation and delivery
Micro-containerised factories	BoP households, hospitals, prisons, schools, businesses	Local NGO, University, entrepreneur, Technology partner, local government authorities	Business model prototyping, production using local raw materials to meet local needs. Converting local waste streams into marketable products. Skills building. Ensuring off-take.	Sales from products	Business model prototyping linking local communities with technology partners and local as well as external markets. Creating trust networks. Ensuring economies of scale. Providing infrastructure of self-contained MCF.

The universities will assist with technical expertise and create research centres, which will be used to teach students entrepreneurship skills. One of the conditions will be that whilst the MCF are running, students can conduct their research. It will also be necessary for the value chain to ensure that the product waste streams will be recovered, recycled, or remanufactured. Some of the MCF will also be designed to process waste streams from the community and produce valuable products.

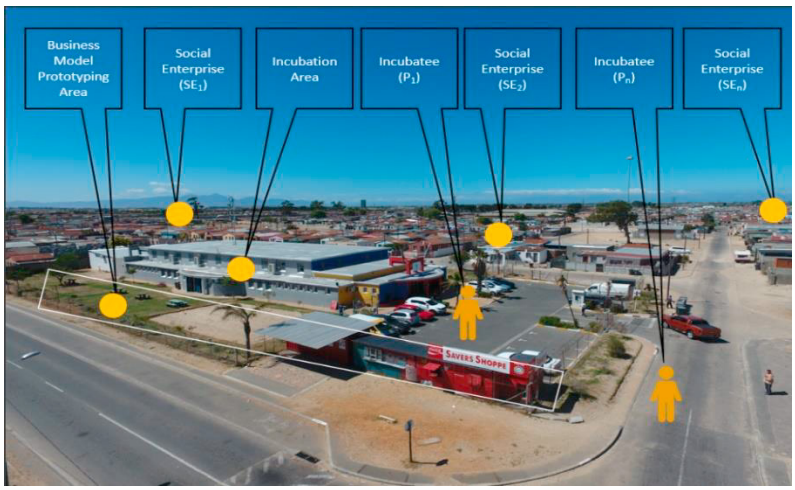


Figure 2: Proposed business model for MCF in BoP Communities in Delft Community
(Delft community Image)

Figure 2 illustrates the proposed business model for Delft community. The concept is to provide a business model prototyping platform. The process begins with the Incubatee (P_1) from the Delft community receiving training at the

Home of Compassion. The Home of Compassion is the Incubation center operated by an NGO, which ensures the engagement and recruitment of incubates from the community. When the incubatee P_1 has completed training they are then taken through real life entrepreneurial training onsite at the business model prototyping area. The business model prototyping area will have onsite MCF that uses different production technologies. When the Incubatee P_1 has performed satisfactorily whilst undertraining at the business model prototyping MCF, they are then released to start up SE_1. The idea is to have the incubatee P_1 taking up SE_1 after being provided with initial capital funding for the infrastructure and resources required to kick start the SE_1. The SE_1 is to be run profitably such that it can be self-sustaining. The SE_1 will be required to payback a monthly instalment from its profits from the third month of operation. These instalments will be used to raise capital for more SEs (i.e. SE_2, SE_3……SE_n) to be implemented in the community. The incubatee P_1 should pay back the initial capital they were given over a stipulated period after which they will assume ownership. The capital paid back will then be used to allow incubatee P_2 to start up another SE_2 in the community and the process will repeat until many incubates up to P_n benefit. The NGO will be responsible for managing the revolving fund and allocating the capital to the next incubatee, who will go through the same process. The idea of the business model is to have initial capital from an external funder at the beginning and using it to build a cluster of MCF in the community over time. The SEs run by the incubates will pay back monthly instalments which includes a fee to cover administrative costs.

5. Proposed conceptual framework

The proposed conceptual framework for creating shared value in BoP communities with MCF is given in Figure 3. The initial phase for creating shared value in BoP communities with MCF is to ensure that there is capability building in the community. Capability building involves making sure that partnerships are formed by different stakeholders where trust is built amongst the partners. This will create a healthy environment for training and upgrading of skills of community members to ensure competence. It is also necessary to provide infrastructure and technology to ensure that the required business structure is achieved. This will be accomplished through the introduction of MCF in the community. These MCF should be implemented at the most suitable sites in the community, where skills training and business model prototyping can be done. The second phase will be to ensure that there is a market for the products by creating a network for supply and demand for the products. The most important thing is to make sure that the products meet the community needs and have natural demand. This will make it easy to sell the products in the community and build a profitable and sustainable business model. Making sure that the business model is competitive and profitable will created a room for scaling up which will ensure sustainability.

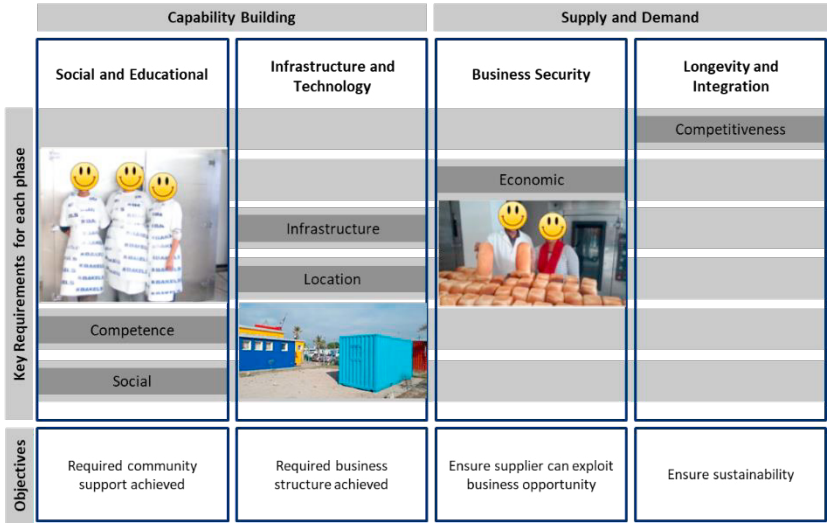


Figure 3: Illustration of the proposed conceptual framework as applied to the Delft community (Adopted from Vermeulen & Oosthuizen [21])

The model shows how skills development in baking at the Delft Home of Compassion center (DHC) can be enhanced by introducing a business model prototyping container bakery onsite. For this case study the initial stages were to form collaboration between Stellenbosch University (SU), technology partners as well as the DHC non-profit organization. The SU team identified the relevant technology partners and the NPO and meetings were conducted to ensure all formal arrangements were made. This led to signing of MOUs which clearly stated the roles of each partner. The DHC team has been very supportive and keen on the case study which is fundamental to the success of the implementation process. The SU team managed to successfully apply for funding to kickstart the implementation of the business model on the initial case study of the self-contained bakery in a container. The container bakery was purchased and moved to the DHC premises. The local authorities and health and safety officers were consulted to ensure compliance issues for the bakery container are met considering that bread will be consumed by locals. A workshop was conducted to come up with a clear plan for the container bakery start-up. This workshop involved the SU team, the DHC team and technology partners. The plan mapped a way forward on meeting bakery compliance issues that had been raised, as well as a way forward on training incubates and the operational plan for the bakery. The container bakery will produce a local traditional bread which will be branded. A supply chain for the distribution of the bread has been created. These initial phases will see through the start-up of the initial case study at the DHC.

The business model prototyping micro-containerised bakery will be used to train incubates to become social entrepreneurs who will later run their own social enterprises. The framework focuses on business model prototyping as a proof of concept which ensures trust networks for business take-off and economies of scale.

6. Conclusion

It is clear from literature consulted that there is a need for sustainable business models and conceptual frameworks to create shared value in BoP communities with MCF. This study conducted a systematic literature review and identified key concepts for creating shared value in BoP communities which were used to develop the proposed business model and conceptual framework. The proposed business model and conceptual framework were then applied to the Delft community in South Africa. The study illustrated a business model prototyping strategy in BoP communities. Future research will involve the actual implementation of the business model and conceptual framework in different communities in Sub-Saharan Africa. The literature reviewed was not exhaustive and this gives room for future studies to focus on improving the proposed business model and framework for creating shared value in BoP communities with MCF.

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